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STATISTICAL BULLETIN

METROPOLITAN LIFE INSURANCE COMPANY

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Excellent Health Record of a War Year

NEVER before has the mortality of the Industrial policyholders of the Company been as low at this season of the year as at present. With a death rate of 7.7, the period January to June has, for the first time, registered a figure definitely below 8 per 1,000. What is even more striking, each month of 1942, except March, has recorded a new minimum death rate, and this excellent showing is a direct continuation of conditions during the latter part of 1941, when, month after month, new low records of mortality were established.

The information available for the country at large indicates that the general population also is experiencing excellent health conditions. For the total population we have not yet any figures for 1942, but a provisional figure for 1941 clearly shows that this was a record health year. For the current year, we have data for 87 large cities, with a death rate of 12.1 per 1,000 for the first 26 weeks of this year, as compared with 12.3 last year. Altogether, the health situation is eminently satisfactory. This accomplishment is the more pleasing because our intensified war activities might have been expected to produce an adverse effect upon national health.

Nine New Low Death Rates in 1942

Among the important diseases, no less than nine show minimum rates among the Company's Industrial policyholders for this season of the year. Three of these are the communicable diseases of childhood—scarlet fever, whooping cough, and diphtheria. Another three are the important respiratory conditions—influenza, pneumonia, and tuberculosis. Typhoid fever, appendicitis, and puerperal diseases complete the list.

Perhaps the most significant of these new lows is that established for influenza and pneumonia. The combined rate is down 23 percent since 1941. The marked decline in mortality for influenza in a single year is, of course, of no particular importance, considering the fact that 1941 was an influenza year. It is significant, however, that the influenza mortality this year is little more than one half what it was at its previous low in 1938. The drop in the pneumonia rate is more im-

portant. It continues the downward trend which was inaugurated with the widespread use of serum and the sulfa drugs in the treatment for this disease. For example, for the 10 years prior to 1938, pneumonia mortality, though fluctuating widely according to the prevalence of influenza, never fell below 79 per 100,000. Then, in 1938, the pneumonia death rate dropped to 66.0 per 100,000, in 1939 to 60.5, in 1940 to 47.1, and in 1941 to 40.9. That is, the pneumonia mortality has been cut more than 55 percent in the brief space of four years. In 1942 the improvement brought the rate to the low level of 35.6 per 100,000.

The gratifyingly low mortality from pneumonia, as experienced today, is the result of two contributing factors, namely, the relatively low prevalence of the disease, and the low case fatality, thanks to the modern methods of treatment. Patients treated with the sulfa drugs, now being used in pneumonia, have a case fatality of less than 10 percent today, as against a figure of about 25 percent or more no further back than 10 years ago, before the introduction of sulfa drugs. Certainly, the conquest of pneumonia seems to be well under way.

The tuberculosis rate in the six-month period was 43.0 per 100,000, or 3.8 percent less than the previous low rate reported at this time last year. The downward trend for tuberculosis mortality extends through a long series of years, and not since 1926 has there been at any time even a temporary setback in the record. In that year tuberculosis ranked second among the important causes of death; today it is seventh. Such is the measure of its improvement.

Communicable Diseases of Childhood

Each one of the four principal communicable diseases of childhood registered lower rates in the first six months of 1942 than in 1941. For all but measles—that is, for scarlet fever, whooping cough, and diphtheria—the rates are the lowest on record.

Appendicitis Down Sharply

Appendicitis, another disease with a minimum rate this year, is one which has benefited greatly by the use of the sulfa drugs, introduced in 1936. The 1942 mortality—5.5 per 100,000—is more than 25 percent below the 1941 figure, and about half of what it was in 1936.

The death rate for the puerperal conditions, which has declined steadily for the past 15 years, established another new low for the first six months of this year. If the amount of the decline was small, this was due entirely to a sharp increase in the birth rate reported for the general population, in which the women insured in the Metropolitan have surely shared.

Record for Degenerative Conditions Favorable

Another factor which has contributed materially to the excellent record of 1942 is the decline, even though slight, in the rate for the

cardiovascular-renal diseases, where we had become accustomed rather to expect increases. Of the four diseases which make up the cardiovascular-renal group, three—cerebral hemorrhage, chronic nephritis, and chronic heart disease—have recorded lower rates, so far, in 1942 than in 1941. In fact, chronic nephritis reached a new low for this period of the year. Only one—diseases of the coronary arteries—reported a higher rate than formerly, and this may reflect changes in diagnostic practice or in certification, rather than in actual mortality.

Two other important diseases of middle and later life—cancer and diabetes—also registered slightly lower rates in the first six months of the year than in 1941. The general situation for these diseases is not very encouraging, however, since with one exception, the present crude rate is the highest on record for cancer, and, with two exceptions, the highest on record for diabetes.

Decline in Motor Vehicle Accidents

The accident situation is of interest this year because of the opposing factors influencing it. Increased industrial activity has resulted in a greater number of occupational fatalities. At the same time, the Government's restrictions on the use of cars have reduced the number of motor vehicle accidents. The June rate for motor vehicle accidents is almost one third less than last year's. For the first six months of 1942 the rate is 6.2 percent below that of 1941. The rate for all forms of accidents for the first half of the year exceeds that of the corresponding period of last year by 4.2 percent, which, in view of all the facts, is a favorable showing.

Insulin Comes of Age

TWENTY-ONE years have passed since the discovery of insulin, which brought the Nobel prize to Banting and his associates, and gave a renewed lease on life to numberless sufferers. The patent on the manufacture of insulin, held by the University of Toronto, expired at the end of last year, and the maintenance of adequate standards of purity and strength is, in this country, now controlled by the United States Food and Drug Administration. Since those early days in the University laboratory, where the first crude insulin was prepared, research has continued unremittingly, and today improved forms of insulin are available, one of which, by its more gradual action, approaches the normal physiological function of the human product. To the current generation of doctors trained in the modern treatment of diabetes, the distressing outlook for the diabetic in pre-insulin days is a matter of historical record rather than of personal experience.

Although all diabetics have shared in the benefit, insulin therapy has been most effective among young persons, in whom the disease takes

an exceptionally severe form. The relative improvement in diabetes mortality in the general population has, accordingly, been greatest at the childhood ages, but some definite improvement is observable at least until age 45. Beyond that age, statistics from the general population are not very conclusive regarding trends because the more frequent diagnosis of diabetes in recent years, as well as the effect of greater survival to later ages, confuse the picture. Much better insight into the true situation is obtained by concentrating the observations on a group of actual diabetics and studying the mortality among these. Fortunately, records of such a group, the patients of the George F. Baker Clinic of Boston have been made available for analysis by the Statistical Bureau of the Metropolitan Life Insurance Company.

In this experience, as in the general population, it is in childhood and in early adult years that the greatest reduction in mortality has taken place, and, indeed, when attention is thus concentrated on a group of actual diabetics, the reductions at these ages are spectacular. At ages under 20, for example, the death rate has been cut to as little as 3 percent of the very high rate prevailing in the pre-insulin era. At ages 20 to 39 the recent rate is only 5 percent of the death rate before insulin. At higher ages the improvement, though not so spectacular, is still very considerable.

Further light on the effect of modern treatment is brought out by an analysis of the causes of death in the same group of diabetics. Assuredly, the death rates from most causes are lower, but this is especially true for those causes which are most amenable to control by the right regime for diabetics, including, in a growing number of cases, the use of insulin. An outstanding example of this is diabetic coma, which has become relatively rare as a cause of death. The death rate from this cause among the diabetics of the Clinic in the period 1929-1939 was only 3.7 percent of the corresponding figure in the pre-insulin period 1897 to 1922. On the same basis the mortality from gangrene decreased to less than 75 percent of its former rate, and that from tuberculosis to less than 25 percent, more than keeping pace with the trend in the general population. Likewise, the mortality from acute infections, such as pneumonia and influenza, has taken a sharp drop, to little more than one third of the former rate; and with the success in the use of sulfa drugs, which were introduced only at the end of the 10-year period here covered, the prospect is for still further reduction.

It is instructive to express the improvements in mortality in terms of the corresponding gains in longevity. Today, the average diabetic child of 10 may be expected to celebrate his 50th birthday, whereas just prior to 1922 most diabetic children lived little more than one year after the onset of their disease. At age 30 the expectation of life now is 27½ years, compared to little

more than six years in the days before insulin. Even at age 50 the improvement is sizable, with an expectation of life of 14½ years today, which is 50 percent more than in the pre-insulin era. And these added years of life are useful and active, not years of invalidism. The diabetic of today is usually able to take his place in the home and in the community, and to lead an almost normal life. The diabetic child goes to school and joins his comrades in study and in play. The adult diabetic is a steady and productive worker and competes successfully with his co-workers. Moreover, this great improvement in the active life of the typical diabetic is of particular importance, because the number of these persons in the population is not only large, but is actually increasing through the aging of the population and through the increased survivals of younger diabetic patients to older ages. By 1950 our diabetics may number a million.

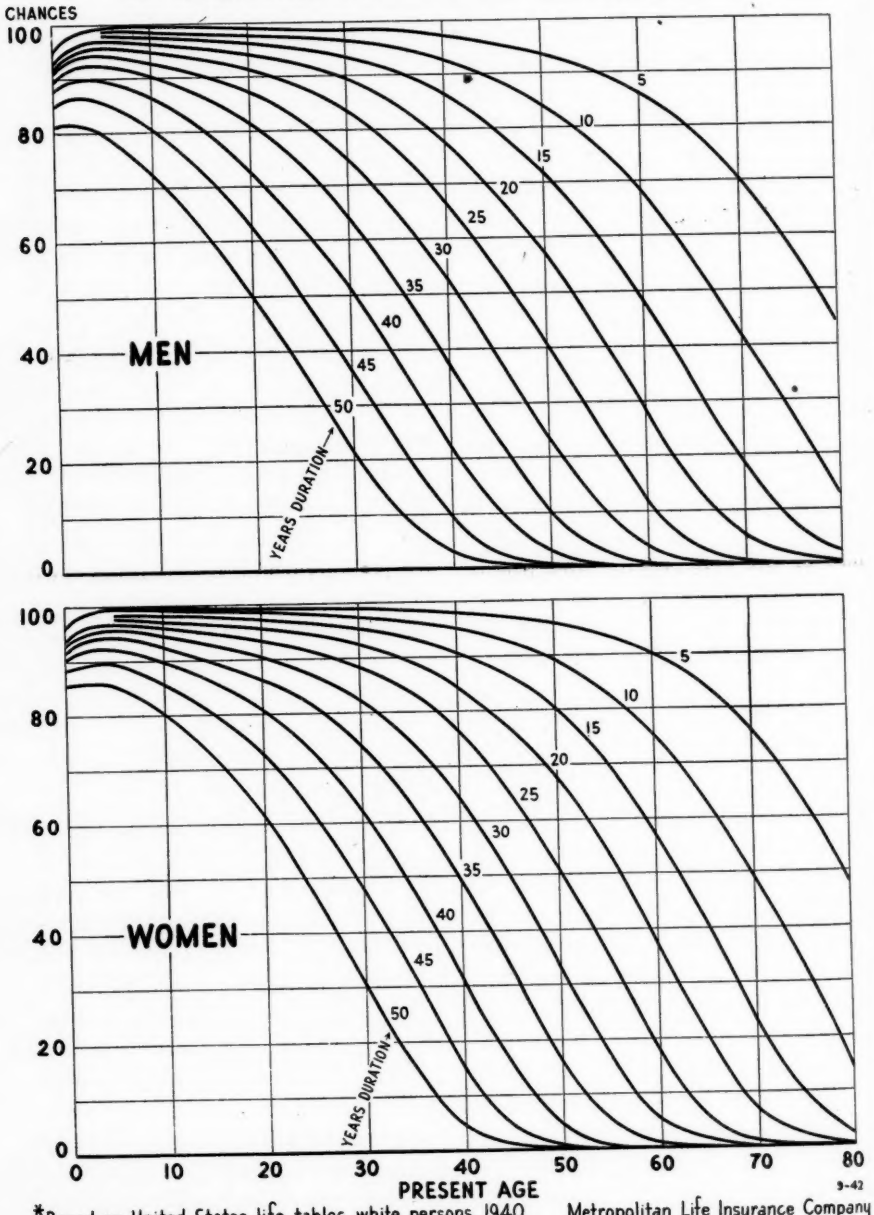
This transformation in the personal and social status of the diabetic patient is due very largely to the epoch-making discovery of insulin, the culmination in a sequence of discoveries regarding the nature of diabetes dating back to 1846 in France. Scientists have been engaged in the investigation of the functions of the pancreas for nearly a century, and research is still in progress. After the first success with the original insulin, investigators have continued to develop and test various types and combinations of the substance in their effort to obtain a drug that shall in its action approach as closely as possible to the insulin in the normal human body. While today success is only partial, the hope is not abandoned that in due course a cure, or better still, a mode of prevention, may be evolved.

The Chances of Survival for Stated Periods

For many undertakings, business or social, it is important to have some idea of the chances of surviving to the completion of a task or to the occurrence of an expected event. To facilitate an estimate of these chances, the chart on page 6, has been prepared which shows the chances per 100 that a person in good health and of specified age will survive for stated durations according to present-day health standards. Details are given separately for white males and white females. The computations are based upon life tables reflecting mortality conditions in the general population of the United States during 1940.

For the average person the chances of surviving for at least five years are, of course, very good under present health conditions. They are better than nine in ten for men anywhere up to age 55 and for women up to age 60. Thus, any person who undertakes a venture that is to be completed within five years is most likely to see it through. Even for a 10-year enterprise, the chances are at least nine in ten of surviving

CHANCES PER 100, FOR A GIVEN PRESENT AGE, OF SURVIVING FOR STATED DURATIONS*



*Based on United States life tables, white persons, 1940 Metropolitan Life Insurance Company

through the period, for a man under 45 years of age or for a woman under 49.

The lapse of a quarter of a century is a relatively short time in retrospect, but in prospect it seems a long way off. However, the chances of living to the end of that period are quite good. For a white male of age 20 they are about nine in ten; at age 30 they are five in six; for those of 40 they are two in three, and even at age 50 they are as high as two in five. For women the corresponding chances are somewhat higher.

A half century marks the occasion for many a celebration. Thus, about 60 percent of the boys and about 70 percent of the girls who finish grade school around age 15 may expect to attend their fiftieth reunion. Almost half of the college men and practically three fifths of the college women of age 21 will be able to attend the celebration of their fiftieth year since graduating from alma mater. For the typical mother, whose average age at the birth of her child is about 28 years, the chances are practically one in three of being alive when her child attains age 50. However, only one out of every five fathers will be alive at such an occasion, their average age at the birth of the child being about 32 years. Life may begin at 40, but only 3 percent of the men of that age and between 4 and 5 percent of the women will live 50 years further.

It will be recognized, of course, that the chances of survival shown in the chart on page 6 are based on the average of mortality conditions in the whole country. In those States and cities where health conditions are better than average, or for persons whose occupations, habits, and general physical condition are above average, the chances of survival will exceed those set forth above.

Three Decades of Cancer Mortality

Our phenomenal success in the control of the infectious diseases has left cancer as one of the outstanding unsolved health problems of the present day. Moreover, its importance is increasing because of the rapidly growing proportion of persons at the older ages, where cancer takes its greatest toll. Considerable interest, therefore, attaches to a series of observations extending over a number of decades, reflecting the mortality experience among the Industrial policyholders of the Metropolitan Life Insurance Company. The essential facts of this experience, extending from 1911 to 1940, are set forth in the chart and table on pages 9 and 10. The data are shown separately for white males and white females, and are standardized to offset the changes in age distribution which have occurred in the interval.

The most striking item in these data is the dissimilarity in the trend of the *recorded* cancer death rate for men, as against that for women.

While the recorded mortality among males from cancer (all forms) has shown a very serious increase by about one third in the course of 30 years, the rate among females has changed but little. Indeed, toward the end of the period there is some evidence of improvement among females, and of a slackening in the upward trend for males. As a result of these conflicting trends, the rates for males and females at ages 1 to 74, widely different in 1911-1915, have converged to a common level of 86.8 per 100,000 in the five-year period 1936-1940. No other important cause of death exhibits such difference in trend of mortality for the two sexes. This peculiarity raises some important questions. It is hardly conceivable that the physiological make-up of males has changed so radically within the last 30 years as to make them much more susceptible to cancer, while females have remained unaffected. It is more likely that a substantial part of the rise in cancer mortality among males reflects improved diagnostic technique and skill as applied to cancers among males. This supposition is confirmed when the trend of cancer mortality is examined according to the site or organ affected.

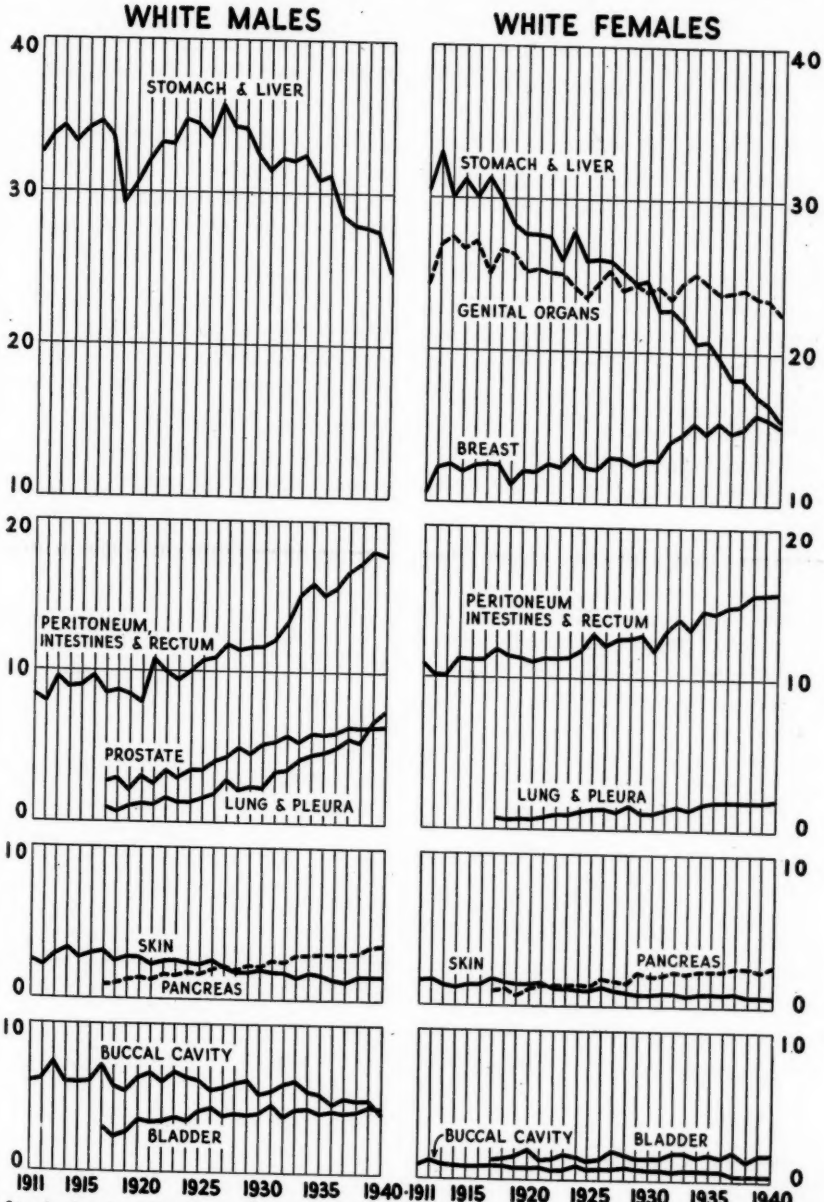
The lines in the chart on page 9 show that, on the whole, the trend has been upward for those sites which are internal and which modern technique is making more accessible for examination. Thus, since 1911, mortality from cancer of the peritoneum, intestines, and rectum has practically doubled in the case of males, and increased by about 50 percent for females. Also, the incidence of deaths from cancer of the pancreas and of the prostate has mounted sharply. A slight upward tendency is discernible in cancer of the bladder. The extraordinary rise in the recorded death rate from cancer of the lung and pleura has been attributed to improved diagnostic techniques that facilitate a differentiation from pulmonary abscess or tuberculosis.

The stomach and liver, alone of the more important sites not readily accessible for examination, show marked improvement in the recorded cancer death rate. This may possibly reflect the current advances in diagnostic practice which lead to a growing recognition of the primary site of cancers formerly ascribed to the stomach and liver, but now certified otherwise.

The most hopeful outlook in cancer mortality is found in those sites that are readily accessible for examination—that is, the female genital organs, the skin, and the buccal cavity. For each of these the trend since 1911 has been gradually downward. An exception is cancer of the breast among females, which is clearly accessible for examination, yet has increased by about 50 percent during the 30-year period, and is now about the level of that for cancer of the stomach and liver, and of the peritoneum, intestines, and rectum. Here, too, it is generally believed that the rise is due to improvement in the practice of

MORTALITY FROM CANCER BY SITE

Standardized Annual Death Rates* per 100,000 White Persons By Sex. Ages 1 to 74
Metropolitan Life Insurance Company, Industrial Department, 1911 to 1940



* Standardized on the basis of England & Wales 1901

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certifying the cancer death to the primary site of involvement, which is often the female breast.

Among women, where the level of the cancer death rate has remained almost unchanged, mortality from the sites that are readily accessible for examination forms a large proportion of the total cancer mortality. On the other hand, among men, who have experienced a constantly rising cancer death rate, only a small proportion of the cancer sites are readily accessible. One can hardly escape the surmise that the upward trend in cancer among males is due largely to improvements in technique which lead to the discovery and recording of cancers.

Although there have been definite shifts in the recorded mortality from cancer of the various sites or organs, some of the changes may be more apparent than real. Difficulties in diagnosis are being overcome by new techniques which make it easier to study sites formerly inaccessible to the physician. In addition, we have evidence that early recognition and treatment of suspicious growths bring their rewards. The American College of Surgeons already has on its files more than 36,000 cases of so-called "cured" cancer. Furthermore, there is now under way intensive research on the origin of the disease, as well as on its diagnosis and treatment. Although we are not yet at the point where we can say that cancer is under control, we already know enough to state that early detection often means cure.

AVERAGES OF ANNUAL STANDARDIZED DEATH RATES* PER 100,000 FROM CANCER—ALL FORMS. WHITE PERSONS BY SEX AND AGE—METROPOLITAN LIFE INSURANCE COMPANY, INDUSTRIAL DEPARTMENT, 1911 TO 1940

AGE GROUP	1936 TO 1940	1931 TO 1935	1926 TO 1930	1921 TO 1925	1916 TO 1920	1911 TO 1915
	White Males					
1 to 74	86.8	85.8	80.6	75.4	68.4	66.6
1 to 24	4.3	3.8	3.2	3.0	2.7	2.8
25 to 44	26.0	25.1	24.5	22.3	22.5	23.0
45 to 74	406.5	403.5	378.6	355.4	318.7	308.3
	White Females					
1 to 74	86.8	89.9	89.0	88.0	89.9	91.4
1 to 24	3.2	3.3	2.8	2.6	2.7	2.7
25 to 44	47.7	48.4	49.0	49.3	53.7	57.8
45 to 74	375.6	390.3	385.6	380.7	383.4	385.3

*Standardized on the basis of the Standard Million of England and Wales, 1901.

Comparative Data on the Causes of Death Among Industrial Policyholders

The following table shows the mortality among Industrial policyholders for June 1942 and June 1941, together with the death rates for the first six months of 1942, 1941, and 1940.

DEATH RATES* PER 100,000 POLICYHOLDERS FROM SELECTED CAUSES. WEEKLY PREMIUM-PAYING INDUSTRIAL BUSINESS — METROPOLITAN LIFE INSURANCE COMPANY

CAUSES OF DEATH	ANNUAL RATE PER 100,000 POLICYHOLDERS*				
	June 1942	June 1941	Year to Date: End of June		
			1942	1941	1940
ALL CAUSES—TOTAL	674.8	701.4	769.1	795.1	806.4
Typhoid fever	0.3	0.4	0.3	0.5	0.4
Measles	.6	1.1	.7	1.3	.4
Scarlet fever	.1	.3	.5	.6	.7
Whooping Cough	1.1	1.2	1.0	1.4	1.3
Diphtheria	.3	.4	.5	.6	.9
Influenza	1.4	1.8	5.5	12.7	11.8
Pneumonia (all forms)	20.5	24.2	35.6	40.9	47.1
Tuberculosis (all forms)	42.1	39.9	43.0	44.7	46.4
Tuberculosis of respiratory system	37.1	35.9	38.7	40.9	41.9
Syphilis	10.4	11.5	10.8	11.9	12.3
Cancer (all forms)	99.5	98.2	102.8	104.8	102.4
Diabetes mellitus	25.4	25.0	29.6	30.3	31.3
Cerebral hemorrhage	52.8	56.5	62.5	64.3	63.9
Diseases of the coronary arteries and angina pectoris	47.2	49.4	59.7	57.2	54.4
Other chronic heart diseases†	137.6	141.9	165.9	169.9	171.5
Diarrhea and enteritis	3.4	3.3	3.3	2.6	3.7
Appendicitis	4.8	6.6	5.5	7.5	8.8
Chronic nephritis	43.9	48.3	52.2	55.9	60.9
Puerperal state—total	4.1	4.9	4.3	4.5	4.7
Suicides	7.2	6.6	7.4	7.9	8.4
Homicides	2.9	3.4	3.5	3.4	3.3
Accidents—total	47.9	50.2	49.2	47.2	42.3
Home accidents	8.9	9.2	12.0	11.9	12.6
Motor vehicle accidents	14.5	20.5	18.1	19.3	15.3
War deaths	3.6	.1	4.5	.1	.1
All other causes of death	117.7	126.3	121.1	124.9	129.2

*The rates for 1942 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†International List (1940) titles 92, 93 (c), (d), (e), and 95.

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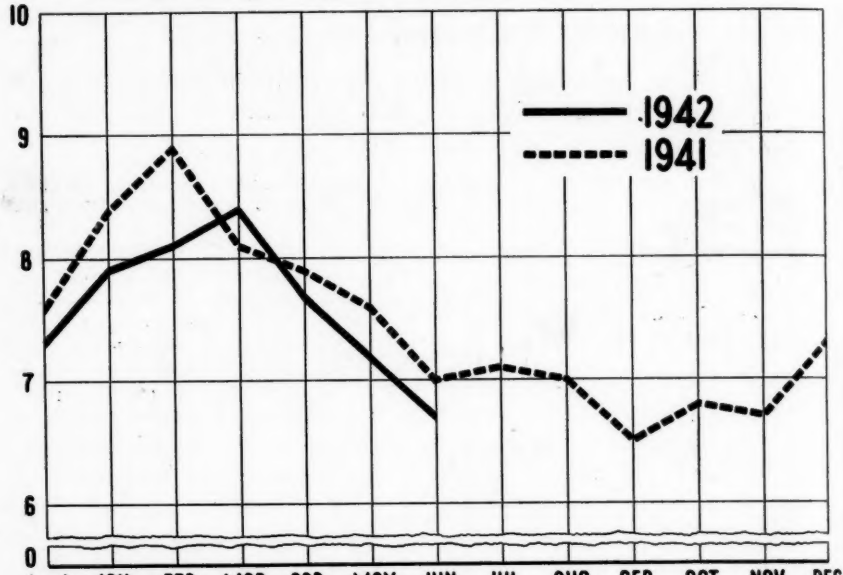
MORTALITY FROM ALL CAUSES

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT, WEEKLY PREMIUM-PAYING BUSINESS

DEATH RATES PER 1,000 · ANNUAL BASIS (*1942 figures are provisional*)



(DEC.)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1941	8.3	8.8	8.1	7.9	7.6	7.0	7.1	7.0	6.5	6.8	6.7	7.3
1942	7.9	8.1	8.4	7.7	7.2	6.7						

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